

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Pre Application of: :  
 Radoslaw Romuald ZAKRZEWSKI :  
 Appl. No.: 10/803,872 : Art Unit: 2129  
 Filed: March 18, 2004 : Examiner: COUGHLAN, Peter D.  
 For: **METHOD AND APPARATUS** :  
**FOR RANDOMIZED** :  
**VERIFICATION OF NEURAL** :  
**NETS** :

Certificate of Mailing

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Sandra Pires

TRANSMITTAL OF REPLY BRIEF

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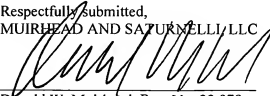
Sir:

Applicant hereby submits the originally-signed Reply Brief Under 37 C.F.R. §41.41 with Certificate of Mailing and postcard receipt for the above-referenced patent application.

Although we believe that we have appropriately provided for any fees due in connection with this submission, the Commissioner is authorized to credit any overpayment or charge any deficiencies to/from our **Deposit Account No. 503596**. Two originally-executed copies of this form are being submitted.

Should there be any questions after reviewing this paper, the Examiner is invited to contact the undersigned at 508-898-8603.

Respectfully submitted,  
MUIRHEAD AND SATURNELLI, LLC

  
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In re Application of:

Radosław Romuald ZAKRZEWSKI

Appl. No.: 10/803,872

Art Unit: 2129

Filed: March 18, 2004

Examiner: COUGHLAN, Peter D.

For: **METHOD AND APPARATUS  
FOR RANDOMIZED  
VERIFICATION OF NEURAL  
NETS**

Atty. Docket: BFM-02801

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PATENT

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
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Sandra Pires

\* \* \* \* \*

**REPLY BRIEF UNDER 37 C.F.R. § 41.41**

Application Serial No.: 10/803,872

Filed: March 18, 2004

Applicant/Appellant: Radoslaw Romuald ZAKRZEWSKI

Title: METHOD AND APPARATUS FOR RANDOMIZED  
VERIFICATION OF NEURAL NETS

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Appeal from a decision of the Primary Examiner dated February 1, 2008

Reply to the Examiner's Answer dated August 20, 2008  
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Att. Docket: BFM-02801

#### **SUBMISSION OF REPLY BRIEF UNDER 37 C.F.R. § 41.41**

This reply brief is being submitted under 37 C.F.R. § 41.41 in reply to the Examiner's Answer dated August 20, 2008. Appellant appeals from the decision of the Primary Examiner dated February 1, 2008, and incorporates by reference herein all necessary portions and arguments set forth in Appellant's Appeal Brief filed on June 12, 2008.

#### **STATUS OF CLAIMS**

This is an appeal from a decision of the Primary Examiner in the Final Office Action dated February 1, 2008, finally rejecting claims 1-36 in the above identified patent application, and claims 1-36 are on appeal. Claims 1-36 stand rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter. Claims 1, 16-19, 34-36 stand rejected under 35 U.S.C. 101 as lacking patentable utility. The previously-stated rejection of claims 12 and 30 under 35 U.S.C. 112, first paragraph, as lacking enablement has been indicated as being withdrawn in the Examiner's Answer. No claim has been allowed or indicated to contain allowable subject matter. Appellant appeals the above-noted rejections. A Notice of Appeal was submitted on April 9, 2008, with a Request for Pre-Appeal Brief Review. A Notice of Decision on Pre-Appeal Brief Review was mailed on April 25, 2008, indicating the case should proceed to the Board of Patent Appeals and Interferences and requiring submission of an Appeal Brief. Appellant submitted an Appeal Brief on June 12, 2008. An Examiner's Answer was mailed on August 20, 2008.

### **GROUND OF REJECTION UNDER APPEAL**

- I. Claims 1-36 stand rejected under 35 U.S.C. 101 as being directed to non-statutory subject matter.
- II. Claims 1, 16-19, 34-36 stand rejected under 35 U.S.C. 101 as lacking patentable utility.
- III. The rejection of claims 12 and 30 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement is indicated as having been withdrawn in the Examiner's Answer.

### **ARGUMENTS IN REPLY TO EXAMINER'S ANSWER**

**Appellant maintains that the Examiner has failed to establish a prima-facie argument that claims 1-36 are directed to non-statutorily patentable subject matter under 35 U.S.C. §101 or lacking patentable utility thereunder.**

In responding to Appellant's Appeal Brief, the Examiner again concludes that a claim that recites an invention that "verifies" has no practical application. No legal support or citations are provided by the Examiner for this statement. Indeed, the Examiner's sole rationale appears to be that Appellant's recited method for verifying accuracy of a component that is implemented from a model can be used in numerous applications and therefore lacks a practical application. Appellant traverses this conclusion and submits that it is in error.

Appellant discusses in the specification that a model is an approximation of an actual physical system, such as an aircraft subsystem, and that may introduce a degree of error or uncertainty. The approximation error between the system and the model may rarely be assessed with certainty and may be expressed in probabilistic terms. Thus, even if an algorithm is deterministically verified against a system model, there may remain a statistical uncertainty regarding validity of such result, which suggests that the use of a deterministic approach to verification may not be suitable. (See, for example, page 36, lines 1-21 and page 44, lines 1-22 of the originally-filed specification.) Appellant's presently-claimed invention provides for randomized verification of the accuracy of a component implemented from a model based on using test points for a test of the component that are randomly selected. (See, for example, page 43, lines 7-22 of the originally-filed specification). Appellant has found that a randomized verification method may be applicable to a much wider spectrum of practical problems than previously developed for the deterministic verification approach. (See, for example, page 47, line 11 to page 48, line 11 of the originally-filed specification.)

Accordingly, Appellant submits the series of steps for a method of randomized verification that are recited by Appellant provides a useful and practical application of verifying the accuracy of a component implemented from a model. As the basis for his rejection, the Examiner relies upon a perceived broad usage of the term model, stating by way of example: "Is this model that of the flight characteristics of an aircraft wing, or a model of the spread of a disease throughout a country, or a model of obesity among people of a given region?" (See, for example, top of page 4, top of page 8, and top of page 9 of the Examiner's Answer.) However, rather than being directed to a particular model, Appellant's

recited invention is directed to a method of verifying the accuracy of a component implemented from a model. Thus, for a mathematical equation of a system model, Appellant's recited invention provides for an improved method for verifying the accuracy of implementing the component from the mathematical equation for the system model. Regardless of what the mathematical equation is characterizing, Appellant's presently-recited invention provides for transforming an unverified component implemented from the model into a verified component and which provides a useful, concrete and tangible result. For example, the information resulting from a test of the component concerning verification of the accuracy of the component to address errors that may have resulted in implementing the component from the model.

Further, the Examiner maintains the rejections under 35 U.S.C. 101 as lacking utility based on the use of an equation in the claims for determining the number of randomly selected samples  $M \geq \frac{1}{\varepsilon} \ln\left(\frac{1}{\delta}\right)$ . The Examiner concludes that the claims lack utility because "When  $\varepsilon$  approaches 0, the value of  $1/\varepsilon$  approaches infinity" and "When the value  $\delta$  is allowed to approach zero and the value of  $\ln(1/\delta)$  approaches negative infinity." (See top of page 5 of the Examiner's Answer). The Examiner has determined that the equation somehow indicates that "infinity is less than infinity which makes no sense" (see page 4 of the August 9, 2007 Office Action). The Examiner's rationale for this rejection seems fundamentally flawed and demonstrably in error.

Rather than being senseless, the equation for selecting the number of randomly selected samples  $M$  indicates that as the confidence value and accuracy level decrease in

accordance with the recited features, the number of randomly selected samples required increases, based on the natural log of one divided by the confidence value and one over the accuracy level. The equation characterizes an analysis that the smaller the confidence value and more precise the level of accuracy desired, the higher the number of random samples required, as dictated by the above-noted equation. Appellant submits there is no arbitrary cutoff as the confidence value ( $\delta$ ) and the accuracy level ( $\epsilon$ ) become smaller and smaller with respect to the number of randomly selected samples recited by the claimed invention in accordance with the recited bounds. Instead, the relationship between confidence value, accuracy level and number of randomly selected samples is accurately characterized by the equations, and defines patentable subject matter in conjunction with the other recited features. That is, if a very precise level of accuracy with a very narrow confidence interval is desired then many random samples will be required to achieve this. This is the relationship defined by the equation according to the variables therein. Appellant submits that the recited features, specifically in connection with the equation for determining the minimum number of required samples for a desired confidence value and accuracy level, have utility and would be well understood by one of ordinary skill in the art.

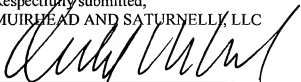
Accordingly, Appellant respectfully requests that the Examiner's rejections under 35 U.S.C. 101 be reversed by the Board.



**CONCLUSION**

In view of the above, and the arguments previously submitted in Appellant's Appeal Brief, it is respectfully requested that the Board reverse all of the Examiner's rejections under 35 U.S.C. 101.

Respectfully submitted,  
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Date: October 3, 2008

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